I CLAIM:

1. A process for continuously converting the energy residing in hot pressurized noncondensable gases containing water vapor into a more useful form, comprising the steps of:

(a) providing a source which continuously produces hot pressurized non-condensable gases containing water vapor whose given pressure is commensurate with the steam pressure desired in the following flash evaporating step and with the desired thermal efficiency

(b) continuously bringing the hot gases into intimate contact with a cool aqueous liquid in a direct-contact heat exchanger having a hot well, where the gases will flow countercurrently to a flow of the cooler liquid and where water vapour will condense and the gases will become drier, said exchanger consisting of three areas / sections; (i) the first is one where the evaporative and heating property and part of the condensing and heating property of the hot gas will be utilized to heat the cooler liquid to the highest temperature it could have when in equilibrium with the hot gases at the given pressure, and thereby cool the hot gases; as well as allow heated liquid and condensed water to collect in the hot well at the top of area (i), while still maintaining the highest possible hot well temperature; (ii) the second is one where the gas and liquid will continue to progressively exchange heat content and supply heated liquid to the hot well at the base of the area, until the' gas reaches the temperature of the liquid coming from the following flash evaporation step; (iii) and the third is one where the gas and liquid will progressively exchange heat content, until the gas as it cools approaches the temperature of the cool liquid entering at the top of the area and the liquid, as it heats, approaches the temperature of the liquid from the flash evaporator.

(c) continuously removing heated liquid from the hot well and flash evaporating it in a flash evaporator at a pressure lower than the pressure corresponding to the equilibrium or hot well temperature to thereby (1) convert some of the water in the liquid into steam and (2) cool the liquid to a temperature corresponding to the pressure of the flashed steam and allow it to collect in a sump in the evaporator.

(d) continuously removing the cooled liquid from the flash evaporator and reintroducing it to the direct-contact heat exchange section; at a point in area (ii) where the gas in the area is at about the same temperature.

(e) continuously removing the flashed steam from the flash evaporator for further use in a more useful form;

(f) continuously replenishing the cool liquid entering at the top of area (iii) and continuously removing excess liquid from the flash evaporator at the appropriate rate in order to keep the liquid in the exchanger and evaporator in balance;

(g) continuously removing the cooled gases from the top of zone (iii) for further use in a more useful form.

2. The process of claim 1, wherein in step (e) said further use involves its use as process steam and/or as a source of energy for the production of electricity using steam turbines connected to a generator and in step (g) said further use involves its use as a

source of energy for the production of electricity using a turbo-expander connected to a generator. .

3. The process of claim 1, wherein in step (a) the source is a know process, but is now adapted to perform at a substantially elevated pressure and, if feasible, higher temperature.

4. The process of claim 1, wherein the gases, from the said source cannot be adapted to perform at a substantially elevated pressure, are turbo-compressed to the desired pressure, with the temperature increased by the compression.

5. The process of claim 1, wherein the steps of, collecting other non-condensable gases containing water vapor and turbo-compressing them to a pressure sufficient to introduce them into the source process1 are added prior to step (a).

6. The process of claim 1, wherein the liquid from the hot well is heated indirectly to a higher temperature to thereby increase the steam pressure in the flash evaporator.

7. The process of claim 1, wherein the pressurized gases are further heated prior to going to a direct contact heat exchanger .

8. The process of claim 1, wherein in step (g), the cool pressurized gases leaving the top of zone (iii), are heated prior to passing them through a gas turbine expander.

9. The process of claim 1, wherein prior to step (b) and after removing any particulates, the hot gases are passed through a gas turbine connected to a generator to produce electricity.

10. The process of claim 1, wherein the oxygen required is supplied from a source under a pressure greater than that of the source supplying the hot pressurized gases.

11. The process of claims 10 wherein the oxygen required is supplied from the electrolysis of water or steam under a pressure greater than that of the source supplying the hot pressurized gases.

12. The process of claim 1, wherein in step (f), the cool liquid, entering at the top of zone (iii) contains dissolved and/or suspended materials, such that the liquid can be concentrated by the recycling of the liquid through the pressurized direct contact exchanger and flash evaporator.

13. The process of claim 1, wherein area (i) of step (b) is used to dry materials.

14. The process of claim 1, wherein undesirable solids and/or gases present in the hot gases and can be removed in the heat exchanger by maintaining the circulating liquid alkaline for acidic gases and acidic for alkaline gases, the substances so formed can then be concentrated and removed from the flash evaporator.

15. The process of claim 1, wherein the non-condensable gas content is in the low range and the pressurized hot gases are sent to a primary pressurized direct contact heat exchanger and processed through the first and second areas of step (b) then they are removed from the exchanger at a temperature close to that of the temperature of the flashed liquid in the evaporator and fed to the suction side of the pump removing the flashed liquid from the flash evaporator, which is capable of pressurizing this removed mixture to a pressure which will condense most of the steam in this removed gas mixture, this pressurized liquid and gas mixture is then sent to a secondary pressurized direct contact heat exchanger where the liquid and gases separate at a temperature corresponding to that of the pump pressure, the separated liquid in the chamber is sent to the top of the primary heat exchanger at a point where the removed gases exit, the heat content of the separated gases in the secondary heat exchanger, containing a low amount of steam, can then be recovered as desired.

16. The process of claim 1, wherein the steam from the flash evaporator, unsuitable for a particular use, is passed through a reboiler to recover its heat content for further use.

17. The process of claim 1 wherein the source process is a combustion process carried out under the earth or sea under pressure, at a site where there is combustible material, and where the 'combustion is supported by a pressurized gas containing oxygen and controlled by water piped to the combustion site from above and where the pressurized hot gases would be piped to a pressurized direct contact heat exchanger above said site and processed to recover its heat content.

18. The process of claim 1, wherein the source process is carried out under the earth or sea under pressure, Where there is combustible material, and where the process is activated by high pressure steam, preferably superheated steam, which allows the material to flow to a pressurized direct contact heat exchanger above said site and processed to recover its heat content.

19. The process of claim 1, wherein, a primary flash evaporator produces steam at the highest possible pressure level, the flashed liquid from the primary is then flashed in a secondary flash evaporator to produce steam at a lower level, if desired this sequence could be continued and, at any stage the flashed liquid could be used to indirectly heat other media, with the final cooler liquid returned to the pressurized direct contact heat exchanger for reheating.

20. The process of claim 1, wherein the cooled gases from the top of zone (iii) are cooled further, in order to reclaim further latent heat, by bringing them into indirect contact with the cooler gases between expansion stages in the gas expander.

21. The process of claim 10, wherein some of the electricity produced is one of direct current which is then fed directly to the electrolysis of water or steam.

22. The process of claim 1, wherein the material to be processed at the source is, after the appropriate comminution, suspended in water and pumped to the source, where the wetted material is processed and the excess water used to cool the gases and any unremoved material in the water is concentrated in the flash evaporator.

23. The process of claim 1, wherein high pressure steam is generated, within the source process or by the hot gases after they leave the source, by a pressurized indirect contact heat exchanger, and used to generate electricity using steam turbines, and while the amount of energy extracted by the pressurized indirect heat exchanger will vary depending on the application, the maximum amount would require that enough energy be left in the hot gases in order to operate the pressurized direct contact heat exchanger so that the latent energy of the water vapor in the gases can be extracted in the flash evaporator.

24. The process of claim 23, wherein prior to going to the pressurized indirect contact heat exchanger and after removing any particulates, the hot gases are passed through a gas turbine connected to a generator to produce electricity.

25. The process of claim 1, wherein in step (g) if said cooled pressurized gases contain carbon dioxide and / or nitrogen, said gases are used to sweep gassy coal beds to release the methane contained therein and trap the carbon dioxide and / or nitrogen thereby producing gases containing pressurized methane.

26. The process of claim 10, wherein substantially pure carbon dioxide in the flue gases is used to accelerate biomass growth in an enclosed space.

27. The process of claim 10, wherein by creating a second false ceiling below that enclosing said space, the oxygen and water vapour generated within said enclosed space, being lighter than the carbon dioxide, can be segregated and removed and used in the pressurized direct contact heat exchanger process and the carbon dioxide recycled to the enclosed space.

28. The process of claim 26, wherein a chimney is created, connected to and surrounded by said enclosed space, tall enough to provide sufficient draft for the hot air generated in said enclosed space, to power turbo-generators to produce electricity.

29 The process of claim 1, wherein in step (a), the source is a fuel cell, which takes in hydrogen and a gas containing oxygen and generates electricity and expels hot gases laden with water vapour, is now adapted to operate at elevated pressures, and if necessary, prior to step (b) the said gases are heated to a desired temperature